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Eaton Hydraulic Service Manuals

1. Eaton Troubleshooting Guide for Heavy Duty Hydrostatic Transmissions used on Concrete Mixers
2. Eaton Hydrostatic Variable Pump Repair
3. Eaton Electronic Proporional Control
4. Eaton Hydrostatic Motor Repair
5. Eaton Pressure Compenstated Pump Repair
6. Eaton Gear Pump Repair
7. Eaton Constant Speed Control Installation
8. Eaton Speed Sensor Installation

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Chapter 1: Hydraulic System

HYDRAULIC SYSTEM - HOW IT WORKS

The Hydraulic System on the Housby Mixers is comprised of two separate hydraulic systems. The Closed Drum Circuit, made up of an Eaton Hydrostatic Pump and Motor, and a Function Control Circuit made up of either an Eaton Pressure Compensated Pump on B2 Mixers or an Eaton Gear Pump of F1 Mixers and the valves, cylinders, and components of the chute, hopper, and bridge axle controls.

Drum Control Circuit

The Drum Control Circuit is used to control the speed and direction of the drum. The Eaton Hydrostatic pump is electrically controlled by the Electric Proportional Control (EPC) mounted on top of the hydrostatic pump. The EPC controls the displacement of the pump. The pump moves oil through a closed loop that includes a fixed displacement Hydrostatic Motor. The motor responds to changes in the pumps' flow by changing speed and direction directly proportional to the change in flow. The motor is attached to a ZF gearbox on top of the front pedestal of the machine. This gearbox links the motor to the drum. For every 143 revolutions of the motor the gearbox turns the drum one revolution.

Function Control Circuit

The Function Control Circuit is used to operate all other functions of the mixer, such as chute and hopper controls, and on B2 Mixers, bridge axle controls.

B2 Mixers.

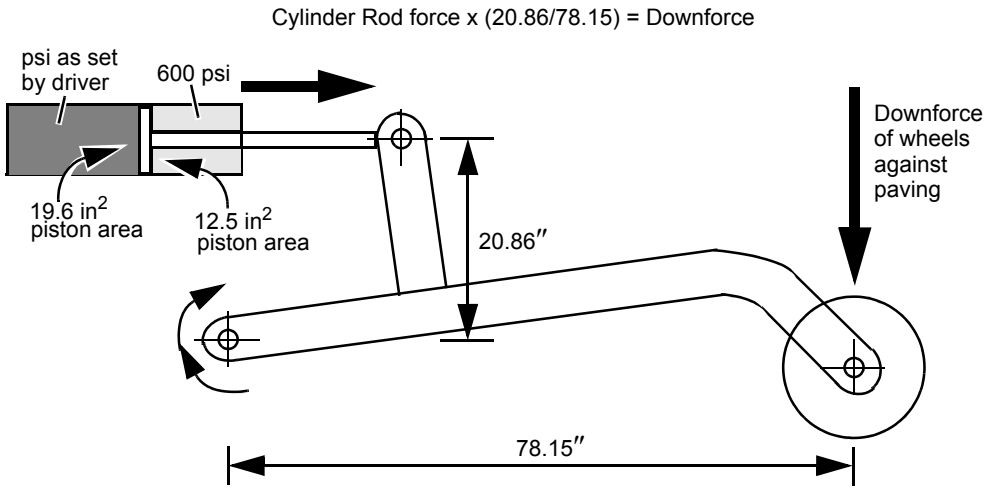
On B2 Mixers the Function Control Circuit is supplied with an Eaton Pressure Compensated Pump. This pump attempts to keep oil supplied to the system at 2500psi at all times. When there is no flow requirements(pressure at 2500psi) the pump stops pumping oil until the pressure drops because of the flow requirements from a function being used. It then responds by pumping oil to the system until pressure once again reaches 2500 psi.

The bridge axle has three separate phases in its operation which will be discussed in order to understand how it operates.

1. **Lowering the bridge axle**-- When the axle is lowering solenoid SV1 is energized allowing flow to the pressure reducing valve. When SV1 is energized pressurized oil also travels to the bridge lock cylinder, releasing the lock. Oil leaves the pressure reducing valve block at the pressure set by the driver and enters port A of the bridge axle valve. Within the bridge axle valve, pressure is reduced by a fixed reducing valve to 600 psi or the setting of the pressure reducing valve, whichever is less. Flow moves through the bridge axle valve and leaves through port C, flowing to the cap end of the bridge axle cylinder. When the cap end of the cylinder becomes pressurized the counter-balance valve on the rod end side opens, allowing flow out of the rod end of the cylinder. The flow from the rod end enters the bridge axle valve at port R. Pressure builds, shifting the sequencing valve (SEQ1) allowing flow from the rod end to the cap end. This regenerative loop allows the cylinder to extend quickly, but with relatively little force.

NOTE: The pressure on both sides of the cylinder is equal, but the cap end size has more surface area, causing the cylinder to extend.

2. **Applying down force** - As the wheels touch the ground, pressure builds to the current setting on the pressure reducing valve. When the pressure exceeds 600 psi (the setting of the fixed reducing valve), the check valve (CV2) closes. This ends the regenerative loop and allows the pressure of the pressure reducing valve to be exerted on the cylinder. Once this pressure is built up cylinder movement stops, causing the pressure relief valve (PRV2) to close. The rod end of the cylinder continues to have 600 psi from the fixed pressure reducing valve which opposes the pressure of the cap end of the cylinder, exerting 7500 lbs of force in the raised direction. Opposing the 7500 lbs of force is the pressure from the cap end of the cylinder, 19.6 in^2 x current pressure setting. The downforce at the wheels results from force applied to a lever. The ratio of the two arms of the lever result in a force multiplier of 0.266 (20.86 divided by 78.15)..



The area of the rod side of the piston in the Bridge Axle Cylinder is 12.5 in^2. The fixed pressure reducing valve keeps the pressure on the rod side at 600 psi when the wheels are lowered. At 600 psi, the rod side of the piston exerts 7500 lbs of force in the retract direction. This force must be subtracted from the force produced on the cap end side of the piston—which is the pressure (set by the driver in the Pressure Reducing Valve) times the area of the cap end (19.6 in^2).

This table shows the recommend pressure settings according to load and the resulting downforce on the bridge axle wheels.

For mix weighing between 3600 and 4800 lb/yd^3 (2250-2500 Kg/m^3)				
Concrete Mix Load	Pressure Setting (PREDV1)	Cap Side Force (psi X 19.6 in^2)	minus 7500 lbs	Downforce (times 0.266)
0 - 3 yd^3 0 -02.3 m^3	leave bridge axle up			
4 yd^3 3.1 m^3	800 psi	15,680 lb	8180 lb	2175 lb
5 yd^3 3.8 m^3	900 psi	17,640 lb	10,140 lb	2697 lb
6 yd^3 4.6 m^3	1400 psi	27,440 lb	19,940 lb	5304 lb
7 yd^3 5.4 m^3	1600 psi	31,360 lb	23,860 lb	6346 lb
8 yd^3 6.1 m^3	1800 psi	35,280 lb	27,780 lb	7389 lb
9 yd^3 6.9 m^3	2300 psi	45,080 lb	37,580 lb	9996 lb
10 yd^3 and up 7.6 m^3 and up	2400 psi	47,040 lb	39,540 lb	10,517 lb

IMPORTANT: Do NOT exceed the maximum Gross Vehicle Weight Rating (GVWR).

3. **Raising the Bridge Axle -** When the bridge is raising solenoids SV2 and SV8 in the pressure reducing valve block are energized. SV2 sends flow from the pressure reducing valve to the bridge axle valve port B and the rear function valve port B. In the rear function valve flow is blocked by the sequencing valve, which is set at 2100psi. In the bridge axle valve flow passes through the check valve (CV1) and the leaves through port R. Flow travel through the counter balance valve into the rod side of the bridge axle cylinder. As the cylinder retracts oil is forced from the cap end of the cylinder through the bridge axle valve and into the pressure reducing valve block. Oil flows through the pressure reducing valve, passes through SV8, and flows into the tank. As the axle raises, pressure on port B stays below 2100 psi due to the massive flow of oil. When the axle reaches the raised position pressure builds causing the bridge lock to lock and the rear function valve's sequencing valve to open. Once this valve opens, all rear functions are restored.

F1 Mixers.

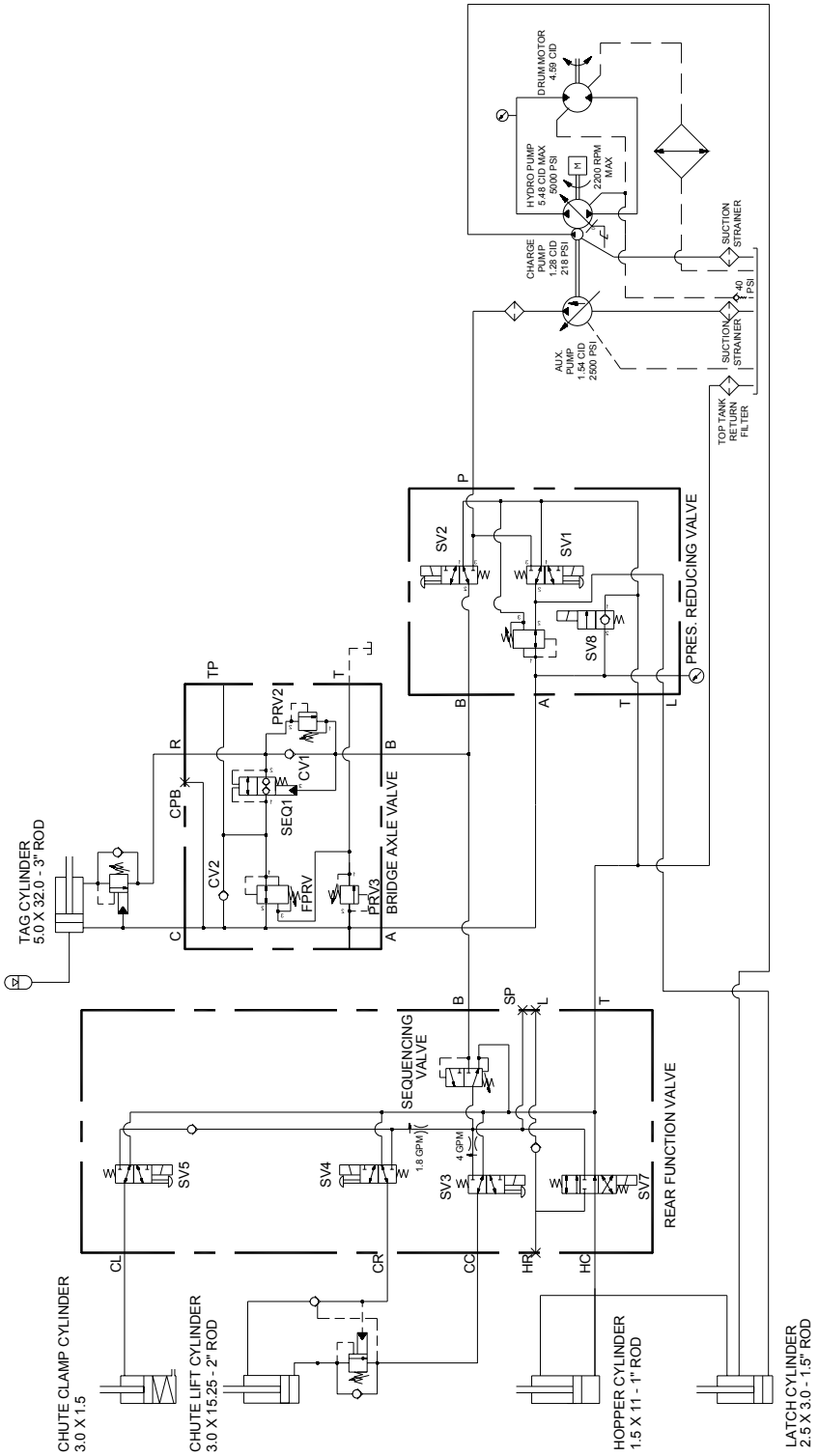
On F1 Mixers the Function Control Circuit is supplied with an Eaton Gear Pump. This pump is a fixed displacement pump, meaning it supplies oil at a fixed volume per revolution of the pump. For this reason the hydraulics are slightly different on an F1 Mixer. When no hydrualic functions are being used (chute and hopper functions) the oil is pumped directly back to the hydraulic reservoir. When oil is needed for the functions the bypass valve on the rear function valve blocks flow to the tank and directs flow to the appropriate function valve. If the bypass valve fails or becomes clogged, there is an 1800 psi pressure releif valve on the tank to prevent damage to the gear pump.

HYDRAULIC COMPONENTTROUBLESHOOTING AND REPAIR

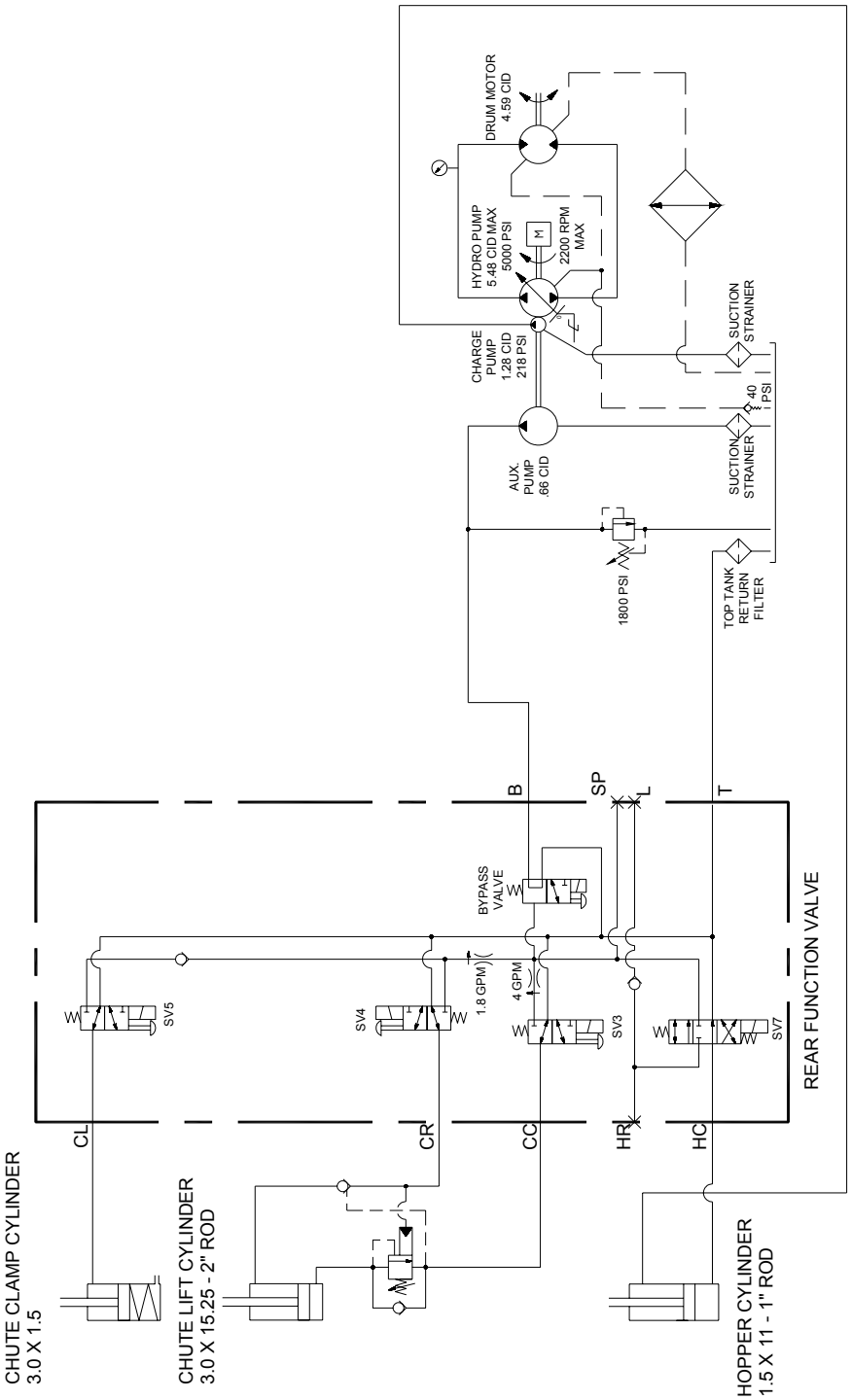
For information on troubleshooting the hydrostatic pump, hydrostatic motor, or hydrualic pump systems refer to the respective Eaton service and repair manuals at the back of the Housby Service Manual.

For troubleshooting information regarding single or multiple functions of the mixer refer to chapter 4, Troubleshooting.

B2 HYDRAULIC SCHEMATIC



F1 HYDRAULIC SCHEMATIC



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Chapter 2: Electrical System

ELECTRICAL COMPONENTS

The Housby Mixers have 3 separate electrical controlling systems on the B2 Mixers and 2 on the F1 Mixers. The systems for drum control and auxillary controls are the same on the B2 and F1 Mixers, and in addition the B2 has a bridge axle control system.

Drum Control System

The drum system is a 12V dc system controlled by a drum controller located in the controller box on the floor of the cab. The controller takes 12V dc inputs from the control panel and the hand held remote and creates outputs accordingly.

Inputs .

There are 5 inputs into the controller that are analyzed and turned into outputs.

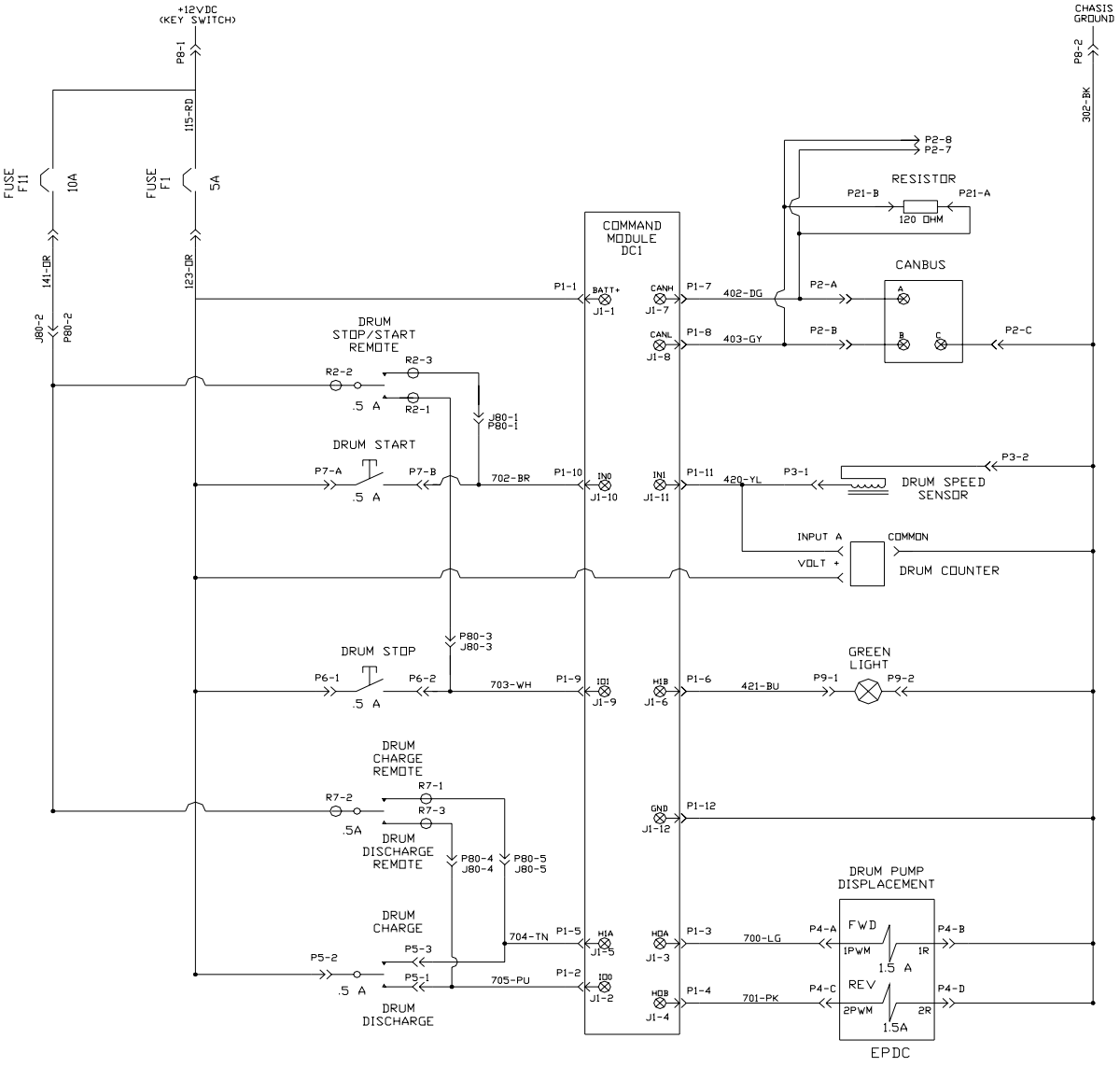
1. *Drum Start* - This 12V dc input at P1-10 is created by pushing the green drum START button in the cab or by flipping the drum RESUME switch on the remote.
2. *Drum Stop* - This 12V dc input at P1-9 is created by pushing the red drum STOP button in the cab or by flipping the drum PAUSE switch on the remote.
3. *Charge* - This 12V dc input at P1-5 is created by flipping the switch in the cab or on the remote to the CHARGE position.
4. *Discharge* - This 12V dc input at P1-2 is created by flipping the switch in the cab or on the remote to the DISCHARGE position.
5. *Speed Sensor* - This input sends pulses to the controller and to the drum counter depending on drum speed.

Outputs.

There are 3 outputs from the controller to the mixers drum system.

1. *Green Light* - This output from P1-6 sends a signal to the green light on the control panel in the cab. It is on continuously in CHARGE, it pulses slowly when in constant speed, and it pulses quickly when in discharge. The light is off if the no drum is stopped.
2. *Drum Forward* - This output from P1-3 varies depending on the speed the controller wants the drum to turn at. It gives no output when the drum is in discharge.
3. *Drum Reverse* - This output from P1-4 varies depending on the speed the controller wants the drum to turn at. It gives no output when the drum is in charge

DRUM CONTROL SCHEMATIC



DRUM CONTROLLER LOGIC

Control	Control Mechanism	Action	Result
STOP	Red Push Button	Push switch less than 2 seconds	Stop drum
STOP-HOLD	Red Push Button	Push and hold switch more than 2 seconds	Clear "resume" memory of drum speed
RESUME	Green Push Button	Push switch less than 2 seconds	Activate drum control and resume previous drum speed
RESUME-HOLD	Green Push Button	Push and hold switch more than 2 seconds	Drum rotates in charge direction @ approximately 2 rpm
CHARGE	Monentary rocker switch	Push left side less than 2 seconds	Drum speed increases if in charge by small increments Drum speed decreases if in discharge small increments
CHARGE	Monentary rocker switch	Push switch left side and hold more than 2 seconds	Drum speed increases if in charge to max speed. Max speed from stop will approximately 2 seconds. Drum speed decreases if in discharge to stop.
DISCHARGE	Monentary rocker switch	Push right side less than 2 seconds	Drum speed decreases if in charge by small increments Drum speed increases if in discharge by small increments
DISHARGE	Monentary rocker switch	Push switch right side and hold more than 2 seconds	Drum speed decreases if in charge to stop. Drum speed increases if in discharge to max speed.
RESUME-HOLD *and* CHARGE-HOLD	Green Push Button Monentary rocker switch	Push and hold switch more than 2 seconds *and* Push and hold switch left side more than 2 seconds	Drum rotates in charge direction approximately 10 degress. Used by mechanics only
RESUME-HOLD *and* DISCHARGE-HOLD	Red Push Button Monentary rocker switch	Push and hold switch more than 2 seconds *and* Push and hold switch right side more than 2 seconds	Drum rotates in discharge direction approximately 10 degrees. Used by mechanics only

Comments:
1. The green lamp will iluminate when in charge mode
2. The green lamp will slowly flash when in the 2 RPM mode
3. The green lamp will quicly flash when in discharge mode
4. Pushing the CHARGE or DISCHARGE side of the switch will turn off the 1 rpm control setting
5. Shutting of the truck key switch (power to control panel) will clear resume memory
6. A speed sensor failure will only dibilitate the constant rpm control feature.
7. The rear pendant will have the same control logic as the unit in the cab
8. The controller will have one extra input/output available for expansion
9. The controller will have four led lights for diagnostic messages
10. The drum speed switch must be released after the drum comes to a stop and pushed again to change drum rotation direction

BRIDGE AXLE CONTROL SYSTEM

The bridge axle control system is a 12V dc system controlled by the bridge axle controller located in the controller box on the floor of the cab. The controller takes inputs from the control panel and creates outputs to the mixer.

Inputs. There are 5 inputs into the bridge axle controller that are analyzed and converted to outputs.

1. *Bridge Axle Start* - This 12V dc input at P11-10 is created by pushing the orange START button on the control panel.
2. *Bridge Axle Raise* - This 12V dc input at P11-2 is created by pushing the Raise/ Lower switch to RAISE.
3. *Bridge Axle Lower* - This input is also at P11-2, however it creates a ground for the circuit. It is created by pushing the Raise/Lower switch to LOWER.
4. *Chute Proxy Sensor* - This 12V dc input at P11-9 is created by having the chute in the fully lowered and centered position. If the Chute is centered and lowered, it is possible to raise and lower the bridge axle by using the bypass switch on the bottom of the control panel. The bypass sends 12V dc to the controller as if the sensor was giving the signal.

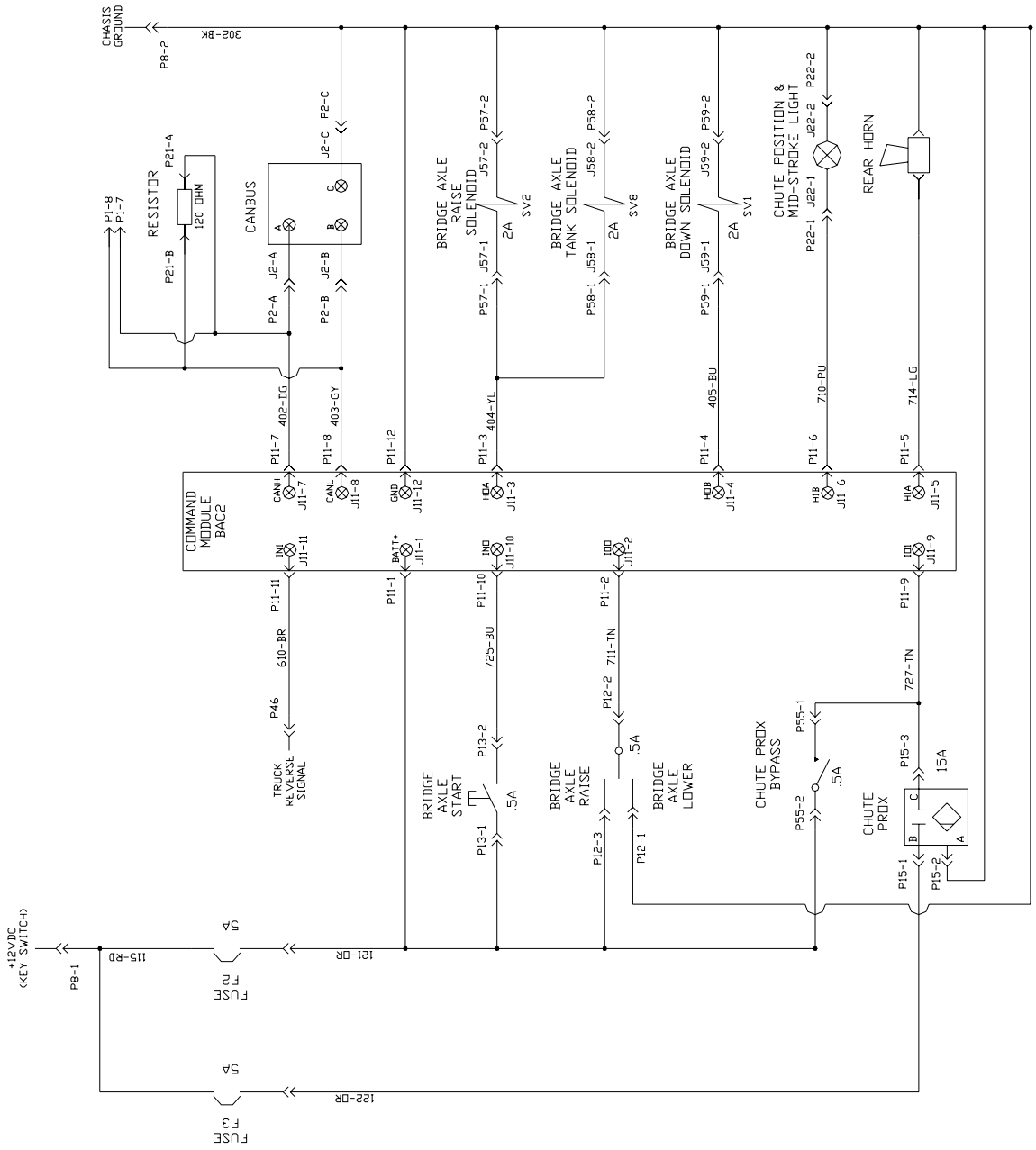
WARNING: Do not use the Chute Override Switch unless you are certain that the bridge axle and the chute will not collide. Serious Damage to the machine may occur. If the sensor is not working, replace it as soon as possible to avoid damage to the mixer.

5. *Truck Reverse Signal* - This 12V dc input is created when the truck is shigfted into reverse.

Outputs.

1. *Bridge Axle Raise* - This 12V dc output sends power from P11-3 to solenoid SV2 and SV8 to raise the bridge axle.
2. *Bridge Axle Lower* - This 12V dc output sends power from P11-4 to solenoid SV1 to lower the bridge axle.
3. *Rear Horn* - this 12V dc output sends power from P11-5 to the warning horn when the bridge axle is in motion.
4. *Chute Position and Mid-Stroke Light* - This 12V dc output sends a signal to the light depending upon the inputs. The light is on during axle movement. The light slowly flashes when the bridge is stopped in the middle of its path, and the light flashes quickly if the chute is not in its fully lowered and centered position.

BRIDGE AXLE CONTROL SCHEMATIC



BRIDGE AXLE CONTROLLER LOGIC

Control	Control Mechanism	Action	Result
STOP	Maintained Rocker switch	Switch in center position	Stop bridge axle motion, effective only 15 sec after succesful start button initiation
RAISE		Switch UP position	System is ready to raise bridge axle upon START command
LOWER		Switch down position	System is ready to lower bridge axle upon START command
START	Momentary button switch	Push more than 1 second	Activates bridge axle motion as determined by position of RAISE/LOWER switch

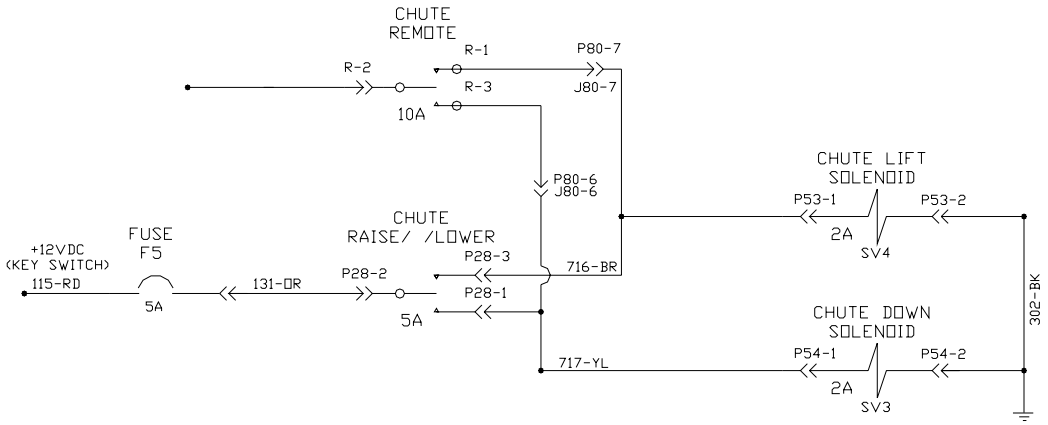
Comments:
1. A NO, PNP proximity switch locating the chute down and centered must be in the closed position before the START button will function.
2. A horn located on the rear of the machine will sound for 15 seconds upon a successful START button initiation
3. The controller will receive a signal whenever the truck back up lights are on. If this signal exceeds 8 volts, the controller will raise the bridge axle as though the rocker switch was in the UP position and the START button was activated. The horn will sound and the light will come on for 15 seconds.
4. A red light will illuminate for 15 seconds when the axle is moving. The red light will flash fast when the prox switch is OPEN, warning the chute is out of position and will flash slowly when the axle is stopped prior to the 15 second completion time until the START button is sucessfully initiated.
5. The controller will have four led lights for diagnostic messages
6. If the power is shut off to the controller in the LOWER position, the controller will power up the lower (SV1) solenoid upon power up.
7. If the power is shut off to the controller in the RAISE position, the controller will power up the raise (SV2) and tank (SV8) solenoids upon power up.
8. If the power is shut off to the controller in the STOP position, the controller will flash slowly the red light upon power up.

AUXILLARY CONTROL SYSTEM

All other fuctions of the mixer such as chute controls, hopper controls, work lights, and cooling fan are controlled manually without a control module.

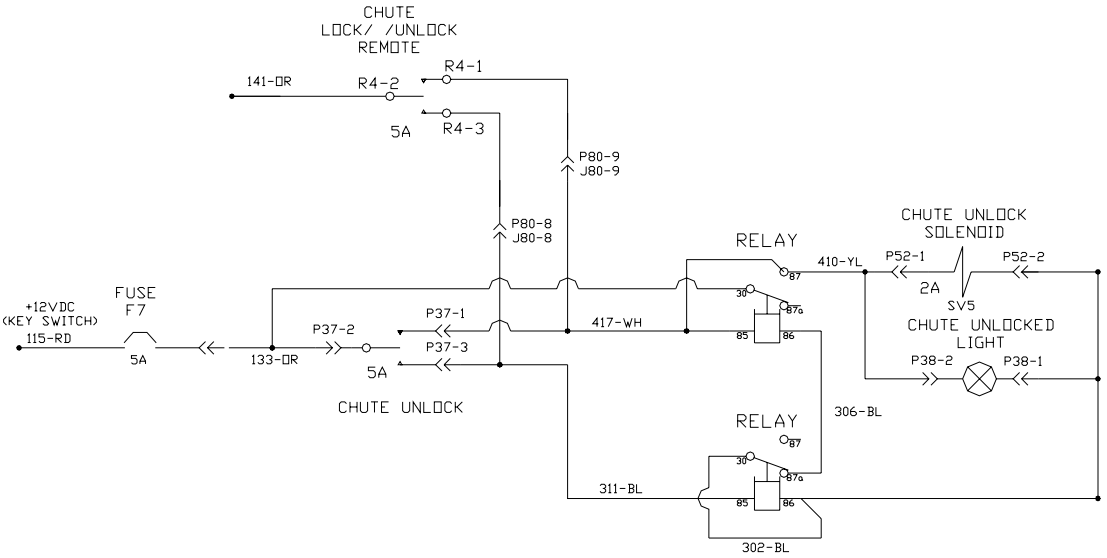
Chute RAISE/LOWER.

The chute RAISE/LOWER momentary switches in the cab and on the remote are wired in parallel with each other and activate solenoids SV4 and SV3 respectively.



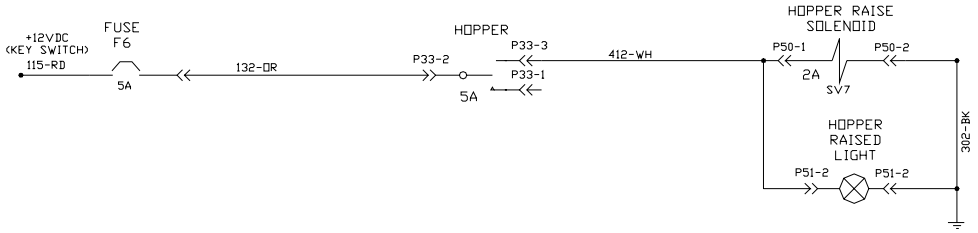
Chute LOCK/UNLOCK

The chute LOCK/UNLOCK momentary switches in the cab and on the remote are wired in parallel and use a pair of relays to hold the power to solenoid SV5 and to the Chute Unlocked light when the chute is unlocked. When the chute is locked there is no power, and the spring in the cylinder holds the chute locked.



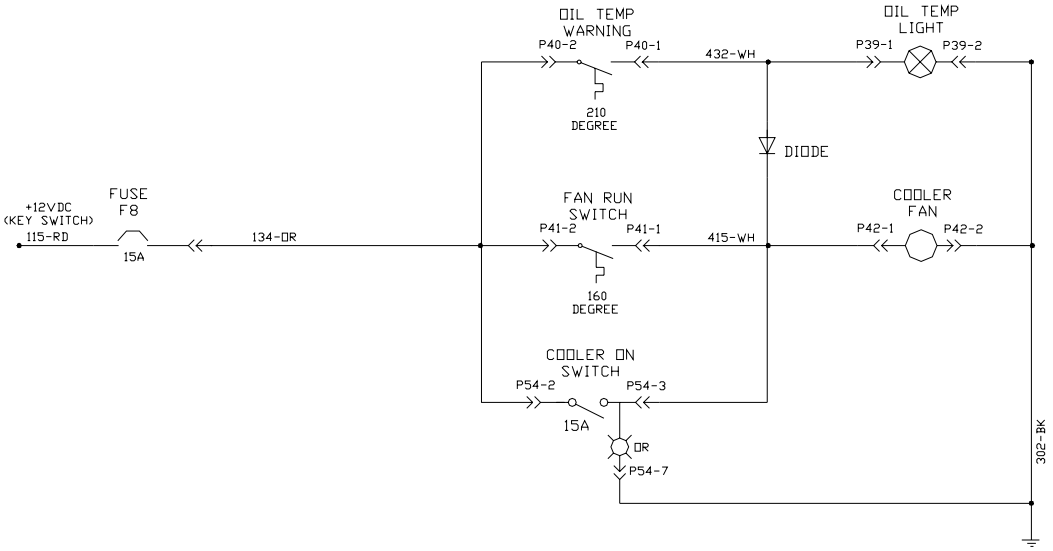
Hopper RAISE/LOWER.

The hopper RAISE/LOWER switch sends power to solenoid SV7 and the hopper raised light when the switch is in the RAISE position. When the hopper is in the LOWER position there are no signals sent out.



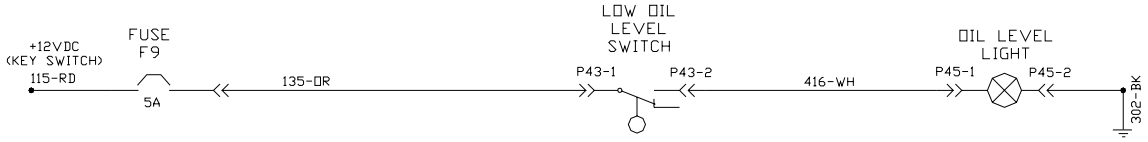
Cooler Fan AUTO/ON.

The cooler fan is operated by a the AUTO/ON switch in the cab. When in ON mode the fan runs continuosly and the light in the switch illuminates. When the switch is in AUTO mode the fan runs when only when oil temperature is above 160 degrees. When the temperature reaches 210 degrees the OIL TEMP light in the cab illuminates, and if the 160 degree temperature sensor has failed the fan begins to run. The fan will continue to run until oil temperature has fallen below 160 degrees.



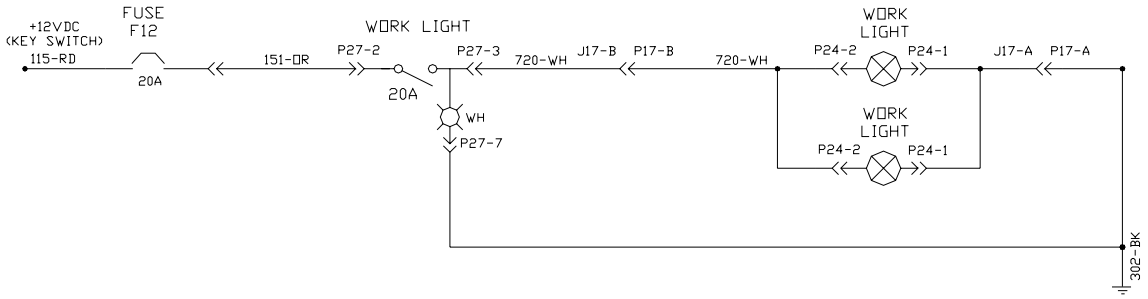
OIL LEVEL.

The OIL LEVEL indicator illuminates when the switch (float) in the oil tank closes due to low oil.



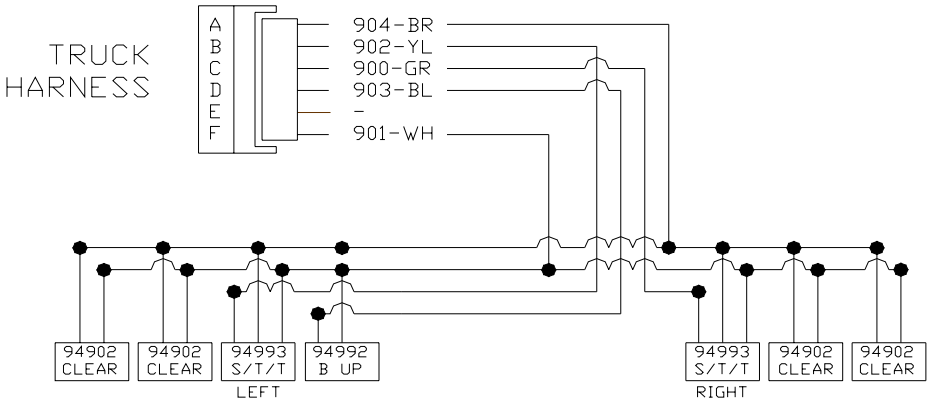
Work Lights ON/OFF. *(Optional)*

The work lights are operated by a switch on the control panel. When in ON the lights and the light in the switch illuminate. When in OFF the lights extinguish.

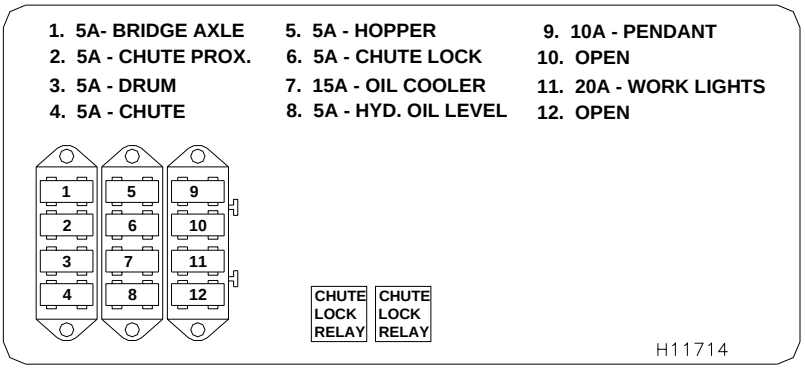


Tail Lights.

The tail, clearance, brake and back-up lights are operated through the truck's electrical system. They are connected to the truck's wiring harness near the rear of the truck.



FUSES



On B2 Mixers there are 10 Fuses and on F1 Mixers there are 8 Fuses. The only difference between the mixers is the F1's have fuse 1 and 2 open. The fuses are located inside the Controller Cover on the floor of the Mixers. A decal like the one pictured above is located under the lid of the controller directly above the fuses, with a fuse number, the size of the fuse, and the circuit affected.

REPROGRAMMING THE DRUM COUNTER

1. With the truck shut down and the key turned off remove the 4 Screws in the Control Panel Cover. Connect a jumper wire from the 'program' terminal to the 'common' terminal.
2. Turn on power.
3. Press SELECT until 'dsPSEL' appears on the display. Set to Yes. Press and hold SELECT to record.
4. Press SELECT until 'tot dP' appears on the display. Set to 0.0. Press and hold SELECT to record.
5. Press SELECT until 'SCLFAC' appears on the display. Set to .0035. Press and hold SELECT to record.
6. Press SELECT until 'rAtE Enb' appears on the display. Set to Yes. Press and hold SELECT to record.
7. Press SELECT until 'rAtE dP' appears on the display. Set to 0.0. Press and hold SELECT to record.
8. Press SELECT until 'rAtE dSP' appears on the display. Set to 60. Press and hold SELECT to record.
9. Press SELECT until 'rAtE INP' appears on the display. Set to 2886. Press and hold SELECT to record.

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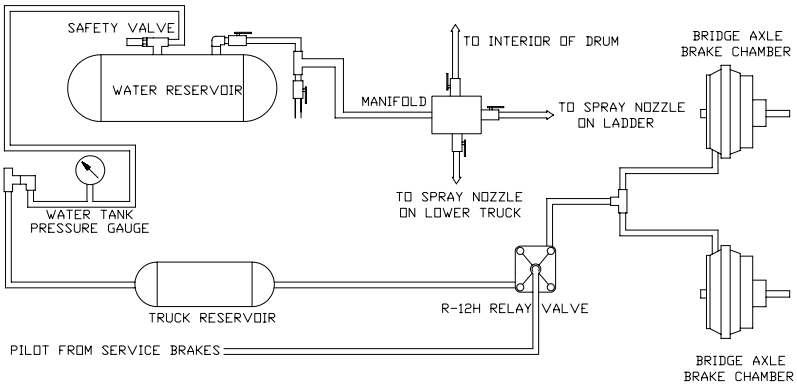
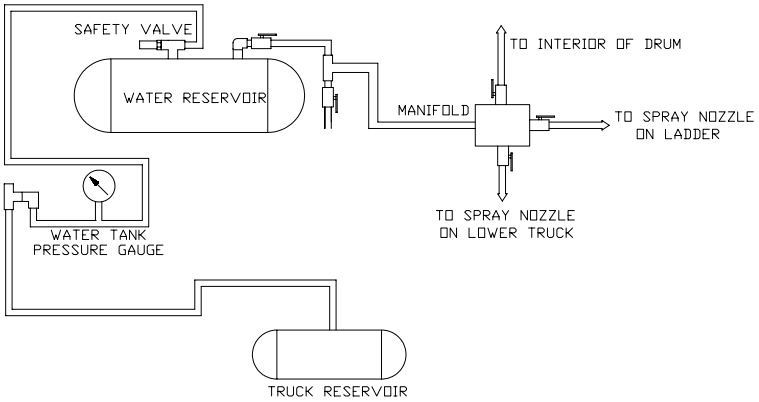
Chapter 3: Water and Pneumatic Systems

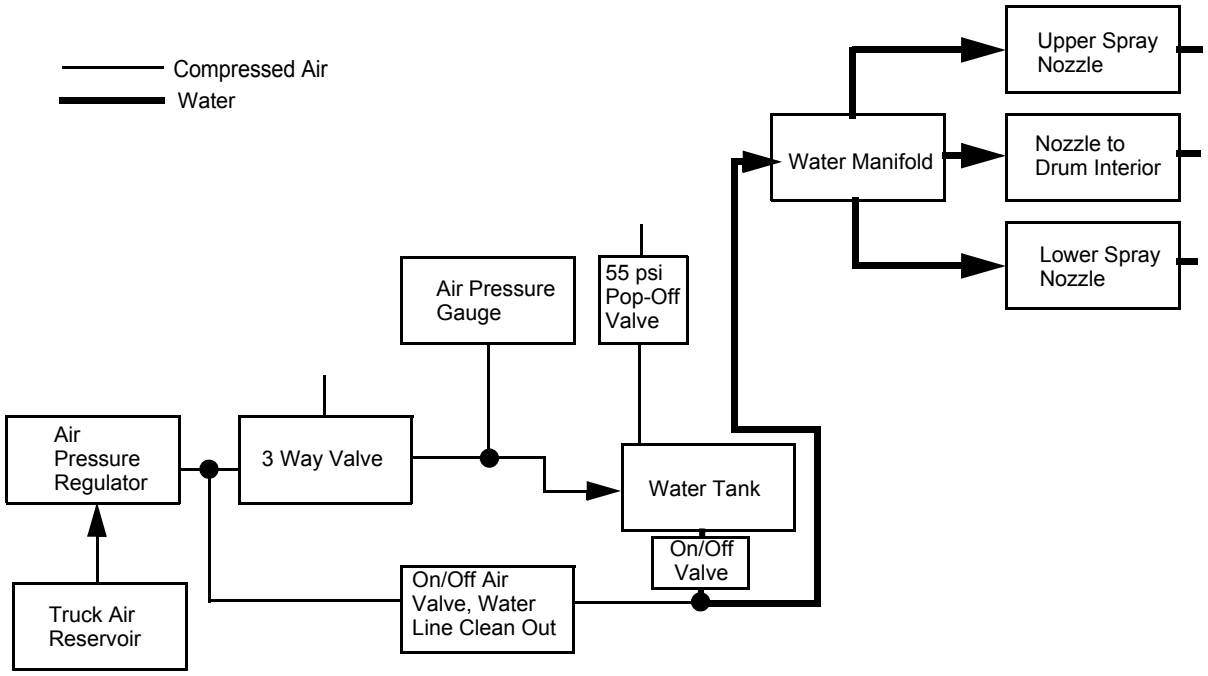
B2 Pneumatic Diagram



F1 Pneumatic Diagram



WATER CIRCUIT DIAGRAM



Chapter 4: Troubleshooting

Symptom	Cause	Remedy
System will not build pressure.	High pressure releif valve stuck open.	Replace high pressure relief.
	Pressure compensated pump malfunctioning. (B2)	Dead head test gauge in high pressure filter. Reading should be 2500 psi. Refer to PC pump troubleshooting.
	Gear pump malfunctioning. (F1)	Check pressure, reading should be 1800 psi while powering a cylinder at the end of its stroke. Refer to gear pump troubleshooting.
	Tank releif valve stuck open. (F1)	Replace or adjust releif valve.
Bridge Axle will not change direction.	Solenoid valves malfunctioning.	Use respective override. Check electrical system. Replace valve as soon as possible.
	Pilot controlled check valve in the Bridge Valve not shifting.	Check for plugged orifice or install new valve.
Excessive fluttering of pressure gauge during transport.	Accumulator charge low.	Check and recharge accumulator.
Bridge axle drifts down when held in mid-position	Check valve leaking.	Clean or replace check valve in rod end of control block.
	Counter balance valve leaking.	Replace counter balance cartridge in rod end of control block.
Chute drifts down while in hold.	Pilot operated check leaking.	Install new valve.
	Down solenoid valve stuck in energized position.	Check electrical. Solenoid should not be energized. Replace valve.
Chute will not raise ***or*** Chute will not unlock ***or*** Hopper will not raise	Solenoid does not operate properly.	Check electrical. Install new valve.
	B2- rear function sequencing valve not operating properly	Replace valve.
	F1- Bypass solenoid does not operate properly.	Check electrical. Install new valve.
Chute will not lower.	Solenoid does not operate properly.	Check electrical. Install new valve. Counter balance valve malfunctioning.
	B2- rear function sequencing valve not operating properly	Replace valve.
	F1- Bypass solenoid does not operate properly.	Check electrical. Install new valve.

Continued on next page...

B2 Pressure Compensated Pump Troubleshooting		
Symptom	**Cause**	**Remedy**
A. Noisy pump caused by cavitation.	1. Oil too heavy.	1. See oil recommendations.
	2. Suction strainer plugged.	2. Clean or replace.
	3. Suction line plugged, too small or too long.	3. Clean line and check for proper size, length and hose rating.
B.Noisy pump caused by aeriation.	1. Oil supply low	1. Fill reservoir.
	2. Air leaking into suction line.	2. Tighten fittings.
	3. Foaming oil.	3. See oil recommendations.
C.Hydraulic system overheating.	1. Oil supply low	1. Fill reservoir.
	2. Oil in system in too light.	2. Drain reservoir and fill with proper viscosity oil. See oil recommendations.
	3. Excessive internal pump leakage.	3. Disconnect case, remove drain line, measure leakage volume while pressurizing hydraulic system. Case drain flow should not exceed 2.5 GPM. If excessive, remove pump, disassemble and repair.
	4. Aeration of oil	4. Tighten fittings.
D. System not developing adequate pressure or flow.	1. Excessive internal leakage.	1. Refer to C-3
	2. Compensator spool stuck open.	2. Disassemble compensator, inspect for stuck spool, clean or replace.
	3. Compensator spring weak or broken.	3. Dissasemble compensator, inspect for weak or broken spring. Replace spring if necessary.
	4. Pump cavitation	4. Refer to causes and remedies for A-1,A-2, and A-3.

Continued on next page...

F1 Gear Pump Troubleshooting		
Symptom	**Cause**	**Remedy**
A. Noisy pump caused by cavitation.	1. Oil too heavy.	1. See oil recommendations.
	2. Suction strainer plugged.	2. Clean or replace.
	3. Suction line plugged, too small or too long.	3. Clean line and check for proper size, length and hose rating.
B.Noisy pump caused by aeriation.	1. Oil supply low	1. Fill reservoir.
	2. Air leaking into suction line.	2. Tighten fittings.
	3. Foaming oil.	3. See oil recommendations.
C.Hydraulic system overheating.	1. Oil supply low.	1. Fill reservoir.
	2. Oil in system in too light.	2. Drain reservoir and fill with proper viscosity oil. See oil recommendations.
	3. Relief set to low.	3. Adjust tank relief to 1800 psi by placing a gauge in the high pressure line and bottoming out, and holding the chute cylinder in the down position.
	4. Aeration of oil.	4. Tighten fittings.
	5. Bypass valve malfunctioning.	5. Check electrical. Install new valve.
D. System not developing adequate pressure or flow.	1. Excessive internal leakage.	1. If there is no flow between the tank and the releif, and pressure does not develop in the system. Replace pump.
	2. Pump cavitation	2. Refer to causes and remedies for A-1,A-2, and A-3.

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Chapter 5: Maintenance

DRUM ROLLER ADJUSTMENT

Drum Rollers have two critical adjustments to maintain for smooth contact between the rollers and the roller track.

1. **Rollers must run parallel to the Roller Track and each other.**

   Refer to and follow the owner's manuals procedure for Mixer Drum Lockout before beginning. In order to align rollers and the roller track, a line is needed on the roller track, close to the back edge. This is done with the drum spinning at a slow speed using a marking instrument held in a constant position with a magnetic dial indicator base or similar fixture. With the drum locked out, set up the marking device on the roller track. Only after the device is in place should the lockout procedure be reversed. Do not place hands on the roller track while scribing the line. The scribed line will be used to align the rollers, *not the rear face of the roller track.*

   After a line has been scribed, lock out the truck as specified in the owner's manual. Align the back face of the drum rollers with the scribed line (fig 2) using a straight edge flat on the back face of the rollers in both directions (fig 3). The final step is verifying that the rollers are parallel with each other, using a straight edge across the back face of both rollers.

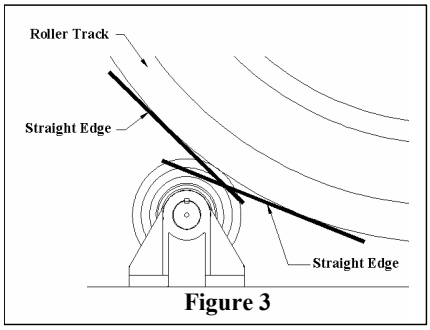


Figure 3

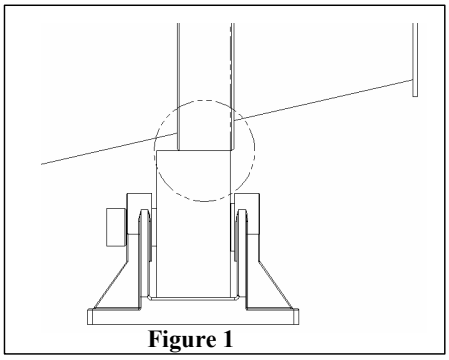


Figure 1

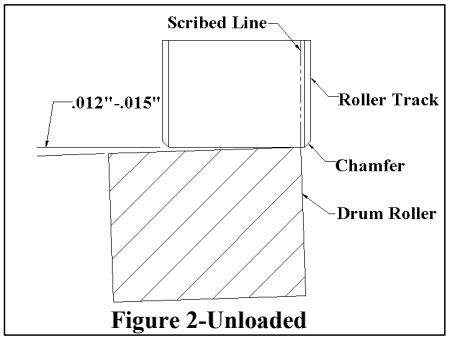


Figure 2-Unloaded

2. **Rollers must run flat on the Roller Track under rated load**.

   Refer to and follow the owner's manuals procedure for Mixer Drum Lockout before beginning. When truck is unloaded, adjust rollers using shims (H10881) until the back edge of the rollers become the contact points. There should be a small amount of light (.012" - .015") showing through the front edge of the roller track (fig 2). This allows the rollers to run flat on the roller track when the truck is loaded.

BRIDGE AXLE ACCUMULATOR CHARGE QUICK CHECK

1. Chock both sides of the front wheels of the truck and lower the bridge axle.
2. Pressurize the system to 2000 psi.
3. Raise the bridge slightly off the ground and stop the bridge. Once again lower the axle while watching the pressure gauge. The gauge will quickly rise once the wheels contact the ground. If one watches closely the gauge will hesitate for a moment and then continue to climb up to 2000 psi. Take note of the point the pressure hesitates.
4. Repeat above procedure and note the hesitation point, they should be about the same.

NOTE: The point at which the needle hesitates is the accumulator pressure. It should be 1750-1850 psi. You should suspect low accumulator charge if:

a. You do not see a pause as described above.

b. The bridge is slow from pulling away from the rear pedestal and when it does go it is erratic.

If a low accumulator is suspected, it will be necessary to lower the bridge and verify the pressure by installing a gauge on the inlet valve. If accumulator still contains low pressure, check for leakage with soapy water at the accumulator valve prior to recharging accumulator.

WARNING: Before beginning service on the accumulator the truck must be locked out according to OSHA lockout/tagout procedures with all pressure relieved from the bridge axle. Accumulator must be entirely discharged if removing the accumulator inlet valve assembly. Removing the accumulator inlet valve assembly with pressure in the accumulator may cause personal injury. Cylinder rod must be extended (Bridge down) before accumulator is charged. Do not stand behind cylinder when charging the accumulator.

ACCUMULATOR CHARGE AND PRESSURE CHECK INSTRUCTIONS

WARNING: Before beginning service on the accumulator the truck must be locked out according to OSHA lockout/tagout procedures with all pressure relieved from the bridge axle. Accumulator must be entirely discharged if removing the accumulator inlet valve assembly. Removing the accumulator inlet valve assembly with pressure in the accumulator may cause personal injury. Cylinder rod must be extended (Bridge down) and all hydraulic pressure relieved before accumulator is charged. Do not stand behind cylinder when charging the accumulator.

1. Purge air from the charge kit by allowing a slight flow of nitrogen to escape while attaching the charge kit to the charge stem.

IMPORTANT: Use only dry nitrogen to charge accumulator.

2. Once the charge kit is connected to the charge stem, loosen the top nut slightly while holding the bottom nut in place. The nut should only be loosened enough to get a pressure reading on the gauge of the charge kit. If the accumulator's charge pressure is less than 1800 psi nitrogen should be added. If pressure is 1800 psi skip step 3.

3. If the accumulator is low on charge, slowly open the valve on the charge bottle. When the pressure reaches 1800psi shut off the valve.

4. Tighten top accumulator valve nut to **50-70 in lbs.** of torque, the bottom nut should be torqued to 100-110 in. lbs.

IMPORTANT: The accumulator charge stem uses tapered seats and requires 50-70 in lbs to seal properly. Over-tightening of the bottom nut can cause damage to the o-ring.

5. Remove charge kit and spray soapy water on valve stem to make sure no air is leaking.

NOTE: Housby recommends that accumulator charge pressure be checked every 60-90 days or sooner if low pressure is suspected.

EMERGENCY JUMPER PROCEDURE

Purpose

To operate or discharge a load from a disabled machine by the use of the hydraulic system and controls of an operating machine.

CAUTION: Be sure the hydraulic system as well as the truck components have cooled sufficiently before disconnecting hydraulic fittings. Do not disconnect the hydraulic motor from the gearbox until hydraulic pressures have been relieved. Use extreme caution when removing hydrostatic hoses. Cleanliness in very important. Dirt, concrete, lint or other contaminates can cause severe damage to hydrostatic transmission.

Procedure

1. Follow the mixer lock out procedures lock out both machines before starting any of the procedures, making certain to place the drum roller lock bolts in both machines to prevent the drum from rotating. **Failure to place the locking bolts in the rollers can result in serious injury from the drum freewheeling.**
2. **Disabled Machine-**Remove the hydraulic motor from the gearbox. It is not necessary to remove the hoses, however, the speed sensor wire may need to be unplugged to prevent damage to the wires. Place motor out of the way of the gearbox to allow for installation of the motor from the operating machine. Use caution in removing motor, as to not damage the hydraulic hoses.
3. **Operating Machine-**Remove the 2 high pressure hoses from port A and B and the case drain hose from the hydraulic motor and place plugs on the ends of the hoses and in the fittings of the motor.
4. **Operating Machine-**Remove the hyraulic motor from the disabled machine and attach it to the disabled machine's gearbox.
5. **Operating Machine-**Remove the 2 high pressure hoses from port A and B and the case drain hose from the hydraulic pump and place plugs on the ends of the hoses and in the fittings of the pump. Disconnect the wires for the speed sensor on the motor.
6. **Operating Machine-**Attach the hoses from the jumper kit (H10434) to the pump and the motor of the operating machine to their respective ports. Be sure to bleed out any air trapped in the hoses, motor, or pump before tightening hoses.
7. **Operating Machine-**Check the oil and add if necessary.
8. The disabled machine's drum may now be operated using the controls of the operating machine, and the drum lock bolts may be removed from the drum of the disabled machine.
9. Once finished unloading the disabled machine, reverse the process to remove and reinstall the motor to the operational machine.

HYDRAULIC CLEAN/FLUSH PROCEDURES

Oil contamination is the primary cause of hydrostatic transmission failure. Before installing any new hydrostatic elements, (pump or motor) the system must be completly free of any contamination. Changing the filter element is not enough to thoroughly clean the system. For this reason it is necessary to flush out the system before replacing components of the hydrostatic transmission.

NOTE: It is recommended that both the hydrostatic pump and motor be replaced at the same time.

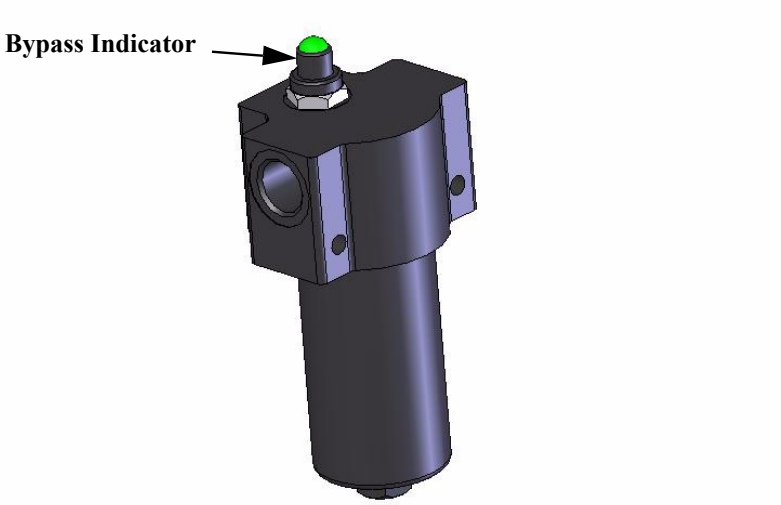
NOTE: When removing hydraulic lines, keep the fittings and the lines plugged with clean plugs to prevent contamination.

After determining the hydrostatic units need to be replaced:

1. Drain all fluid from the system at the lowest point.
2. Remove old hydrostatic pump and motor.
3. Remove the filter element and the hydraulic tank clean out cover.
4. Check the suction hose for kinks, collapsed or flaking liner, or any other obstructions. Inspect all other hoses and fittings and replace as required.
5. Check the inside of the hydraulic tank for contamination (particles of steel or brass, sludge, dirt, etc.) and be sure the ports and fittings on the tank are not obstructed with foreign particles.
6. Flush all hoses, filter housings, and hydraulic tank with clean kerosene or solvent several times, and blow out with air pressure.
7. Reverse flush the oil cooler several times with clean kerosene or solvent and blow out with air pressure.
8. Hand wipe the inside of the hydraulic tank and filter housing with clean, lint free towels.
9. Clean all hydrostatic pump and motor hose fittings and replace o-rings as necessary.
10. Replace filter elements, filter gaskets and hydraulic tank clean-out cover gasket.
11. Reinstall pump and motor units.
12. Fill reservoir, hydrstatic motor and pump cases, hoses, etc. with clean pre-filtered oil. Make certain that the oil meets the fluid recommendations of the equipment manufacturer.
13. Proceed with start-up procedure.

NOTE: Although these procedures will take considerable time to complete, we at Housby feel that they are extremely important to prevent unnecessary replacements or the hydrostatic components.

HIGH PRESSURE FILTER



The high pressure filter installed on the hydraulic system of the Housby mixer, contains a bypass valve to protect the filter element from collapsing. On the top of the filter is a bypass indicator. It is green in normal operating conditions and turns to red when in bypass(filter plugged). The only time there is flow through the filter is when a function is being used (hopper, chute, or bridge axle). If during the operation of these functions the indicator shows red the oil is bypassing the filter and your system may become contaminated, causing a malfunction of valves or the hydrualic pump. When the filter is running in bypass, be sure to replace the filter as soon as possible.